

Social Policy Report

Giving Child and Youth Development Knowledge Away

Volume XVIII, Number IV

2004

From Baby Einstein to Leapfrog, From Doom to The Sims, From Instant Messaging to Internet Chat Rooms: Public Interest in the Role of Interactive Media in Children's Lives

Ellen Wartella, Allison G. Caplovitz, and June H. Lee

Abstract

Interactive media have come of age. The range of interactive entertainment products, intended to be used by children in and out of school settings is growing: CD-ROMs, computers, the Internet, video games (for a variety of handheld and console platforms), interactive toys (including educational talking books), and a variety of wireless software for cell phones and other wireless devices. In short, for today's children, interactive media have become part of the media landscape in which they are growing up. These devices represent the most recent in a century-long introduction of media technologies into the lives of children.

Little systematic research has been conducted to either legitimize or dispute claims about the impact of interactive media content on children's cognitive and social development. Further, few investigations have been conducted that reflect recent advances in interactive technology, such as handheld devices, wireless technology, and interactive toys. The empirical research on children and interactive media has yet to match the myriad of questions posed about its effects. This research, however, has become a growing area of study as interactive media continue to pervade children's lives and as the technology itself continues to evolve. This review examines what we know about the role of interactive media in children's lives and the policy issues ignited by the popularity of interactive media.

Social Policy Report

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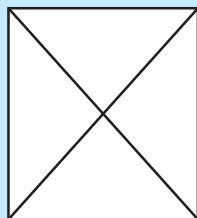
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From the Editor

In this issue of *Social Policy Report*, Ellen Wartella and colleagues discuss what is known about the new interactive media that pervade children's lives today. Computers and the internet, video games, CDs and cell phones are among the new technologies that have become a routine part of children and youth's lives today. The authors' summary of children's use of these technologies demonstrates that they are as present in children's lives today as books and TV were to previous generations.

While we have a long history of excellent and important research on television and children, these new technologies have not been as well studied. One outstanding contribution made by this article is to point out where we need research as well as what we now know. Numerous claims or suspicions have been made about these technologies but few have been subjected to empirical research. The increasingly young age at which children begin to interact with these media and the amount of violence in videogames, fully as great if not greater than that in TV, are just two important issues that need more research.

Furthermore, this technology continues to evolve making timely research and study of its effects even more critical. Hopefully such research could then feed into further development of the technology for children's use or at least into policies that could regulate children's use. Gender and income differences in availability of these technologies and hence in their use are just two issues that point out the need for social attention.

I believe that this technological revolution will have as much impact on our lives as did the industrial revolution a century ago. It is imperative that the scientific community be in front of this revolution so that we can understand how it may interact with human abilities and propensities. Children's interaction with this media is the area of most concern and that should be of the highest priority for research and policy attention. This article outlines what we need to be doing. Brooke and I hope that child development researchers and policy makers take heed.

Lonnie Sherrod, Ph.D. Editor
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Public Interest in the Role of Interactive Media in Children's Lives

As recently as 2002, academic books were being published about “new media,” but the growing numbers of interactive technological devices are hardly new. Indeed, many of today's university students cannot recall a time when they didn't use computers, and most are young enough to have used CD-ROM technologies as children. Interactive media have come of age. The range of interactive entertainment products, intended to be used by children in and out of school settings is growing: CD-ROMs, computers, the Internet, video games (for a variety of handheld and console platforms), interactive toys (including

For today's children, interactive media have become part of the media landscape in which they are growing up.

educational talking books), and a variety of wireless software for cell phones and other wireless devices. In short, for today's children, interactive media have become part of the media landscape in which they are growing up. These devices represent the most recent in a century-long introduction of media technologies into the lives of children.

The history of 20th century media for children, especially motion pictures, radio, and television, is a history of recurring public controversies about the power of these media to influence children and the appropriateness of media content for child audiences. Social science research, news media, and public policy investigations have focused on how these media colonized the leisure time of subsequent generations of children, how they influenced their knowledge and attitudes about the world, and how they affected their own social behavior (see the Surgeon General's study of Television and Social Behavior in 1972). By the turn of the 21st century, interactive media, especially video games and the Internet, became the focus of a new round of public controversies about their role in children's lives.

Just as earlier media technologies were quickly adopted by generations of children, there is evidence to suggest that today's interactive media technologies are being used by children with great interest and engagement. The public discussion of interactive media is reminiscent of that of earlier media: parents and others concerned with children's welfare express both optimism about the promise of the technology itself to enhance children's learning and concern about the perils of exposing their children to inappropriate content and people in a wired, networked world.

Although some have raised concerns about children's use of interactive media such as computers (e.g., Cordes & Miller, 2000; Healy, 1998), little systematic research has been conducted to either legitimize or dispute claims about the impact of interactive media content on children's cognitive and social development. Further, few investigations have been conducted that reflect recent advances in interactive technology, including studies on the use and impact of handheld devices, wireless technology, and interactive toys. Explorations on the implications of media convergence (e.g., the manifestations of content across different platforms), accompanied by media consolidation in the industry itself (e.g., the America Online and Time Warner merger in 2001), are just starting to emerge with the new FCC deregulation enacted (Children Now, 2003). The empirical research on children and interactive media has yet to match the myriad of questions posed about its effects. This research, however, has become a growing area of study as interactive media continue to pervade children's lives and as the technology itself continues to evolve.

This review examines what we know about the role of interactive media in children's lives and the policy issues ignited by the popularity of interactive media. It draws on two major compendia of research on children and interactive technologies: The first (Wartella, O'Keefe & Scantlin, October 2000) was funded by the Markle Foundation; and an updated compendium (Wartella, Lee, & Caplovitz, November 2002) was funded by the National Science Foundation. Both are available at www.digital-kids.net. These reports acknowledge the relative paucity of research on the impact of interactive media on children's development. Although

In New Media as in Old, Content Matters Most

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Over the past 100 years, parents, educators, and policy-makers have greeted each new communications medium with a mixture of fear and hope. At the advent of radio and then of television, many adults worried that children would be seduced by the medium into abandoning more worthwhile pursuits (e.g., reading, play with friends) while others saw great potential for expanding young people's horizons and creativity. Although the pace of change in electronic media has increased exponentially in recent years, both scholars and society are asking the same question: Do the *media* themselves have positive or negative influences on young people? Meanwhile the youth of the world effortlessly incorporate cell phones, email, games on many platforms, and a vast array of information and entertainment on the Internet into their lives. We can learn some lessons from 50 years of television research and policy that may improve our understanding and policy approaches to these new media.

First and foremost, the *content* of a medium is almost always more important than the characteristics of the *medium* itself. The effects of television depend primarily on whether it is prosocial or violent, informative, or mind numbing. A great deal of programming is violent and stupid, but both television and radio also provide education and information that reaches broad audiences of children and adults in the U.S. and around the world. Similarly, what people learn from electronic games and Internet websites depends largely on the content of those media, which ranges from extreme violence and repetitive "action" games to exciting educational materials and an unprecedented scope of information and entertainment available with one click on *Google*.

Second, we know something about what policies do and don't work. In the U.S., our first instinct seems to be government regulation, but we have had little success in restricting television violence over the last 50 years. With globalization of electronic media, particularly the Internet, regulation by any one government is even more difficult. Policies promoting television with positive educational and social content have had more success than efforts to prohibit content. The Children's Educational Television Act, which became law in 1991, requires broadcasters to provide programming that meets the educational and informational needs of children; it led to an increase in educational programming on commercial stations (Kunkel & Wilcox, 2001). Both public and private nonprofit organizations have supplied funds to produce good programs, many of which form the backbone of our public television offerings for children.

By extension, if we are serious about using the new electronic media for children's welfare, then we should emphasize policies designed to promote positive content rather than relying solely on those designed to prohibit access or restrict content. Our experience with television tells us that leaving the media environment entirely to commercial producers for whom the "bottom line" is primary does not usually generate high-quality content. We need to bite the bullet and find creative ways to provide quality products that can maximize the enormous potential of these new media to contribute to our children's welfare.

there is a growing literature on the topic, most of the extant research has focused on the amount of time children spend using interactive media and studies of the influence of violent content in video games on children's social behavior. This report centers on research conducted in the United States and is organized according to five major themes surrounding children and interactive media: access and use, cognitive development, social development, advertising and privacy, and policy initiatives that have sought to address particular concerns. Because the availability of current research varies by platform (e.g., the Internet vs. computers vs. video games), the most pertinent platform(s) will be reviewed in each section.

Media Use and Access

We know much about children's use of some interactive technologies (such as computers, video games, and the Internet) and almost nothing about their use of others (such as interactive toys and various wireless appliances such as cell phones and PDAs). In addition, although data on the time young children spend with interactive media are being collected, the *content* of programs or activities remains largely overlooked. This section focuses on how children of different ages, genders, and socioeconomic classes use interactive technologies and how the content used differs among these groups.

Overall Statistics

The Annenberg Public Policy Center conducted a national survey involving 1,235 parents of 2- to 17-year-olds and 416 8- to 16-year-olds (Woodard & Gridina, 2000). According to their study, *Media in the Home 2000*, American children live in a media-rich environment. In homes with children ages 2-17, 70% owned a computer, 68% owned video games, and 52% had online access. For non-interactive media, 98% of households had at least one television, 97% owned a VCR, 78% had a subscription to basic cable, 31% to premium cable, and 42% subscribed to a daily newspaper. For the first time, online access surpassed newspaper subscriptions. Interactive media had begun to permeate many

children's bedrooms: among 8- to 16-year-olds, 20% had a computer in their bedroom, of which 54% had Internet access.

Although television continued to dominate children's time with media, interactive media occupied a significant portion of 2- to 17-year-olds' time. Parents reported that, on average, these children

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spent 34 minutes a day on a computer, 33 minutes playing video games, and 14 minutes on the Internet (Woodard & Gridina, 2000). From this same survey, data on very young children's computer use had begun to emerge: According to reports from 145 parents of 2- to 3-year-olds, even these young children spent an average of 17 minutes on the computer, 19 minutes playing video games, and 5 minutes on the Internet daily (Jordan & Woodard, 2001).

Recently, the Kaiser Family Foundation funded a nationally representative survey of 1,065 parents of 0- to 6-year-olds, a commonly overlooked population among media research (Rideout, Vandewater, & Wartella, 2003). Parents reported that their children 6 and under were spending approximately 2 hours per day with screen media (including television, computers, and video games). In addition, among 0- to 6-year-olds, 48% had used a computer and 30% had played video games. Among the 4- to 6-year-olds who reported using a computer and playing video games, they did so for approximately 1 hour each day (Rideout, Vandewater, & Wartella, 2003). Interactive media has become a significant part of the environmental context and has the potential to influence development from an early age.

General statistics on use and access mask important demographic differences, however, and children's use of and access to interactive media are known to vary according to age, gender, and socioeconomic status.

Age Differences

In general, older children are heavier users of interactive media—adolescents spent the most time using the Internet, playing video games, and generally using the computer compared with

preschoolers and elementary school-age children (Woodard & Gridina, 2000). Examinations of interactive-game play suggested a curvilinear relationship between age and game play: Among young children (ages 2-7), video game play increased with age, whereas among an older age group (9- to 12-year-olds), game play appeared to decrease with age (Wartella, O'Keefe, & Scantlin, 2000).

While overall use was more prevalent among older children, the use of educational content was more common among younger children. Younger children preferred and spent more time playing educational games than did older children. Compared with 6- to 8- and 9- to 12-year-olds, 0- to 5-year-olds played more educational video and computer games (Wright et al., 2001). Others have also found that 6- to 8-year-olds used the computer less often than did older children, but used it for educational programs and games more often (Becker, 2000).

Gender Differences

Gender differences were not found in Internet or overall computer use but persist in the gaming domain. Boys consistently spend more time with video games than do girls (64 minutes per

day for boys vs. 30 minutes per day for girls in the Woodard and Gridina 2000 study, for instance). Gender differences emerged as

early as the preschool ages: Among 4- to 6-year-olds, boys played video games more often and for longer periods of time than did girls (Rideout, Vandewater, & Wartella, 2003).

These gender differences could in part reflect the different appeal of existing game content for girls and boys (Wartella, Lee, & Caplovitz, 2002). Sensorimotor and sports games—which do not appeal to most girls—dominate the games available to younger children; accordingly, boys played more sports games and sensorimotor games (action, fighting, racing) than did girls (Wright et al., 2001).

Boys' and girls' interests are also differentiated on the Internet: Boys were more likely to use the Internet for fun, games,

to find out about music, and shop than were girls; whereas girls used the Internet to look for information more often than did boys (La Ferle, Edwards, & Lee, 2000). The Pew Internet and American Life project found that although both teen boys and girls used the Internet to pursue their interests (e.g., seeking information on hobbies, visiting entertainment Web sites), there were qualitative differences in other uses (Lenhart, Rainie, & Lewis, 2001). Girls emphasized the communicative uses of the Web, using it for email and instant messaging more than boys did, whereas boys performed more activities other than communication and information seeking, such as downloading games and music, trading and selling things, and creating Web pages (Lenhart, Rainie, & Lewis, 2001). These differences may imply gender differences in online interests, or in comfort levels with different online activities. Thus, although the gender disparity in computer use has narrowed, gender differences in specific activities may persist. Whether these differences translate into future interest in science and technology remains an open question.

Socioeconomic Differences

Much has been made in the popular press about the digital divide: unequal access to computer technologies and the Internet among different groups (commonly defined in terms of socioeconomic or ethnic-group disparities). Income was a significant factor in ownership of all media except for video games (Woodard & Gridina, 2000). Among high-income households (earning an annual income of more than \$75,000), 93% own computers, compared with 77% of middle-income households (earning \$30,000-\$75,000) and 30% of low-income (earning below \$30,000) households. Caucasian American households were more likely to own a computer than were African American and Hispanic American households. Ownership of a video game system,

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however, was more prevalent in low-income households than in high-income households (Woodard & Gridina, 2000). According to a U.S Department of Commerce study (2002), Internet use increased by 25% among the lowest-income households while those at the highest income levels increased their use at an 11% growth rate. The Department of Commerce estimated that 2 million people per month were becoming Internet users and the fastest Internet adopters are those in lower incomes, lower education levels, and the elderly.

While inequalities in ownership still exist, the gap appears to be narrowing. The digital divide is more than simply a question of access, however. Socioeconomic differences are evident in the quality and functionality of the hardware and software (Becker, 2000), which affect the range of potential activities and content available to children. Future research must examine the divide with these nuances in mind.

Cognitive Development and Learning

Much of the “hype” surrounding interactive media (e.g., CD-ROMs and talking books) involve claims that they are superior platforms for children’s learning compared to television, especially because of their interactive nature. Investigations of the effect of talking books on young children’s literacy skills have revealed mixed findings: Compared to a control group, young children who used a talking book did better in tests of phonological awareness but not word reading (Chera & Wood, 2003). The use of talking books has also been linked to children’s comprehension of story meaning (Medwell, 1998). Others found that interactive storybooks conferred neither benefits nor disadvantages for story memory compared with audiovisual presentations (Ricci & Beal, 2002). The experience of reading electronic books appears to be different from reading regular books: Young children were attracted to the iconic elements (clicking on games, illustrations, and icons) of the electronic book at the expense of reading text (deJong & Bus, 2002), suggesting that consideration of the interactive formats available in new media is important in examining their impact. Interactive stories that included effects that were incidental to the story interfered with children’s ability to retell the story cohesively

but effects that were integral to the story supported children’s understanding (Labbo & Kuhn, 2000).

Thus, interactivity is not always beneficial to learning, although researchers have suggested that various aspects of interactivity may accelerate children’s cognitive development. By allowing children to organize information, provide structure to the activity, adjust the material to suit their needs and abilities, and receive feedback, interactive technologies may encourage processing that will enhance children’s learning and increase their metacognitive abilities by prompting them to think about their cognitive strategies (Calvert, 1999; Krendl & Lieberman, 1988; Papert, 1980).

Unfortunately, interactivity itself is a disputed concept and little empirical research exists demonstrating the mechanisms by which interactivity enhances learning.

Unfortunately, interactivity itself is a disputed concept and little empirical research exists demonstrating the mechanisms by which interactivity enhances learning. It is often discussed as if it were unidimensional, with little regard for the medium, activity, or content under consideration. The amount and nature of interactivity changes depending on whether one is examining immersive first-person video games, primitive arcade games, web-browsing, playing with an interactive toy, or computer-mediated communication such as email and instant messaging. Analyses of interactivity have uncovered different conceptions derived from communication, sociology, and computer science, resulting in difficulty in arriving at a comprehensive definition (Vorderer, 2000). The themes that are common across these concepts pertain to the ideas of responsiveness, reciprocity, and choice (e.g., Downes & McMillan, 2000; Heeter, 1989; Rafaeli, 1988). The question then becomes: responsiveness to whom, reciprocity with whom, and choice for whom? That is, the user’s actions, coupled with a medium’s ability to respond to those actions, jointly influence the quality of interaction. Research on the potential for interactive technologies to enhance children’s learning in informal settings

(i.e., the home) has centered on their use of interactive games (i.e., computer and video games; Subrahmanyam, Kraut, Greenfield, & Gross, 2001). There is some evidence that interactive games can improve children's spatial and iconic (i.e., the ability to read images) skills, although these skills may not generalize to broader contexts (see Lee & Huston, 2003, for a review). Others have suggested

Our understanding can be better informed with an analysis of the amount and quality of interactivity that characterize the range of interactive media, by examining the specific aspects of interactivity (e.g., user control vs. engagement vs. receiving feedback) that might be most critical to learning, and by exploring the particular skills or approaches to learning activated by interactive games.

that interactive games have the potential to cultivate sound learning principles, including the ability to discern patterns within and across multiple sign systems (e.g., images, words, and symbols); cycles of probing, hypothesizing solutions, evaluating hypotheses, and reprobating; allowing the player to experience intrinsic rewards and growing mastery; extended effort and practice; and recognizing multiple ways to progress toward a goal (Gee, 2003). These claims await empirical verification. Television research has shown that content, not the medium, is the most important in determining outcomes of viewing (e.g., Anderson, Huston, Schmitt, Linebarger, & Wright, 2001). This will also likely be true of interactive media. In addition, however, these technologies may produce "medium effects" by changing users' mode of thought or representation, or by fostering learning skills and approaches to problem solving.

Learning occurs as a result of a confluence of factors: the affordances of the technology, how the child uses those affordances, and the context of use (Lee & Huston, 2003). Our understanding can be better informed with an analysis of the amount and quality of interactivity that characterize the range of interactive media, by examining the specific aspects of interactivity (e.g., user control vs. engagement vs. receiving feedback) that

might be most critical to learning, and by exploring the particular skills or approaches to learning activated by interactive games.

Social Development

There are three major areas in which interactive media are thought to play an important role in social development: (a) how the virtual world may supplant real-world social relationships, (b) the function of networked media in adolescents' identity development, and (c) the influence of violent video games on children's aggressive behavior. In these cases, interactive media are thought to be more powerful than previous media as social influencers because users are actively engaged in constructing and acting out social roles.

Social Relationships

Over time, the role of the Internet in social-relationship building has undergone a reconceptualization. Initial findings from the *HomeNet* study seemed to suggest that the introduction of the Internet led children to become socially isolated, depressed, and lonely (see Wartella, O'Keefe, & Scantlin, 2000 for review). But upon closer examination, others have contended that after 2 years of being online, children's local social network declined, but their distant social network actually increased (McKenna & Bargh, 2000). Follow-up analyses on the same *HomeNet* sample 3 years later showed that children experienced a decline in depression from the initial findings, and that loneliness was no longer associated with using the Internet, as it was when the Internet was novel to them (Jordan, 2002; Kraut, Kiesler, Boneva, Cummings, Helgeson, & Crawford, 2002).

These findings suggest that the Internet may serve different functions for different people (Gross, Juvonen, & Gable, 2002; McKenna & Bargh, 2000) and that these functions may change over time. These functions may be reflected in the ways in which individuals use the Internet. One study uncovered three types of Internet users among adolescents: "non-social" users primarily surfed the web and played single-player games, "asynchronous" users communicated with others via email and posted on message boards, while the "synchronous" user

communicated via Instant Messenger, participated in chat rooms, and played multi-user games (Heitner, 2003).

What drives these differences is not understood. Researchers have found that 11- to 13-year-old children who reported feeling socially isolated or lonely in school were more likely to communicate online with people they did not know well. Well-adjusted children, on the other hand, used the Internet as another means to communicate with their everyday peers (Gross, Juvonen, & Gable, 2002). Research suggests that the Internet does not necessarily lead to social isolation and loneliness; in fact, about half of the teens surveyed by the Pew studies said the Internet improved their relationship with friends while about a third mentioned that the Internet was a place to meet new friends (Lenhart, Rainie & Lewis, 2001). More research is needed to ascertain the role that the Internet plays in children's social lives.

Identity Formation

Identity formation is a major developmental task confronting children and adolescents. New technologies offer children the opportunity to explore their identities in different ways. The Pew studies found that 24% of teens reported to being a different person when communicating online (Lenhart, Rainie & Lewis, 2001). Researchers have established that children and adolescents talk about their lives via the Internet (Bers & Cassell, 2000; Thomas, 2000), they are interested in creating "cool" images of their characters (many children added their own graphics, animations, or drawings to enhance and personalize their avatars; Thomas, 2000), and they also identify with certain characters in interactive games (McDonald & Kim, 2001). These avenues provide children with an outlet to express who they are or who they want to become. What is still unknown is how this experimentation aids children in forming their identities, especially the lonely, socially isolated individuals. Do the interactive technologies take away from important face-to-face interactions or does it provide an additional outlet for children to express themselves? What is clear is that children are able to experiment with different facets of themselves via the new media. Calvert (2002) believes that, "As a society, our challenge is to help young people navigate their real

life and their online 'selves' to forge a constructive, unified personal identity" (p. 68).

Violent Video Games

The most widely studied aspect of the impact of interactive media on children's social development concerns the role of violent video games on children's learning of aggression. In addition to correlational (Buchanan, Gentile, Nelson, Walsh, & Hensel, 2002; Collwell & Payne, 2001; Funk, Buchman & Germann, 2000) and experimental research (Fleming & Rickwood, 2001; Robinson, Wilde, Mavracruz, Hydel, & Varady, 2001), meta-analyses have also been conducted (Anderson & Bushman, 2001; Sherry, 2001) to inform this relationship. Less is known about the long-term implications of playing violent games because of the paucity of longitudinal studies. Overall, the literature is consistent in suggesting a positive link between using violent interactive media and children's aggressive behavior.

New technologies offer children the opportunity to explore their identities in different ways.

Perhaps the most persuasive evidence comes from the meta-analyses. Anderson and Bushman (2001) analyzed 33 separate studies of violent video games on children's behavior and found the overall effect size to be positive and significant ($r = .19$): The use of violent games resulted in an increase in aggressive behavior, aggressive cognition, aggressive affect, physiological arousal, and a decrease in prosocial behavior. Another meta-analysis on 25 studies found the overall effect size between video game play and aggression to be positive and significant ($r = .15$), with a larger effect size for those games containing violence against fantasy and human characters ($r = .15$) in comparison to sports violence ($r = .08$; Sherry, 2001). Both meta-analyses revealed an increase in effect size over time between aggression and violent game content (Bushman & Anderson, 2001; Sherry, 2001), suggesting that the content may be getting more violent, or the content is affecting the players more, or both.

While both meta-analyses found comparable effect sizes in the studies analyzed, the conclusions about the relative power of interactive media to teach aggression differed across the two meta-analyses. While neither study specifically assessed the effect size of television compared with interactive games, Sherry (2001) contended that there was only a small effect of video game play on aggression in comparison to that of television (Bensley & Van Eenwyk, 2001). His conclusion was based on converting the overall effect size for interactive games, $r = .15$, into a Cohen's $d = .30$; others found the effect of television violence on aggression to be $d = .65$ (Paik & Comstock, 1994). Bushman and Anderson (2001), on the other hand, warn that violent video games pose a public-health threat to children and it is greater than that of television.

What both groups of researchers do agree on is that longitudinal research is needed in this area to assess whether repeated exposure to violent video games increases long-term aggression. At present, little is known about the long-term effects of playing violent games, including whether they can affect personality or behavior. Violent content in interactive technologies has important implications for behavior, but that link has not been specifically measured in comparison to television. These findings will have practical implications for game design and parental monitoring, as well as policy repercussions, including regulation (both at the industry and government levels) and possibly a re-examination of the current ratings system.

Advertising and Privacy

Children are an important present and future audience for advertisers. They have personal buying power and influence purchasing decisions within the family (Guber & Berry, 1993; McNeal, 1992; Wartella, 1995). Analyses of children's spending patterns for over 30 years estimated that children influence between 25 and 40% of household purchases (Reese, 1996). As children's spending power and influence over their parents grow, marketers are casting their nets wider than ever before (Reese, 1996). The advertising deluge is no longer limited to Saturday morning and after-school television, but has now permeated the

online environment. Children can now interact with their favorite commercial characters on the Internet. Advertising practices on the Internet, however, are much less apparent than those we have come to recognize on television. Two fundamental issues are important considering online advertising: violating children's right to privacy, and unfair and deceptive advertising practices (Montgomery & Pasnik, 1996.)

First, children and their family's privacy can be invaded by using profiling tactics. Children are often asked to provide personal information online, such as name, age, gender, and e-mail address. Moreover, online advertisers collect information about individuals and specifically target each person based on his or her personal interests (Calvert, 1999). Companies are increasingly using "cookies" and intelligent agents that track and catalog the interests and habits of the online visitors (Turow, 2001). Soon, elaborate profiles may exist about each individual user. A recent survey — *The Internet and the Family 2000* — conducted at the Annenberg Public Policy Center (<http://www.appcpenn.org>), found that almost half of American parents were not aware that websites gather information on users without their permission (Turow & Nir, 2000). Moreover, parents and children had very different ideas and opinions about giving out personal information to websites. The 10- to 17-year-olds were much more likely than parents to say it is OK to give sensitive personal and family information to commercial websites in exchange for a free gift (Turow & Nir, 2000).

Second, online ads are frequently integrated within the content in a branded environment. The separation between content and commercials that is required for television is absent from the online environment. The entire website can be an opportunity for children to interact with the product brands and brand characters, such as *Tony the Tiger* and *Chester the Cheetah*. In October of 1998, Congress recognized the dual need to protect children's privacy and regulate online marketing to children and passed the Children's Online Privacy Protection Act (COPPA), which went into effect April 21, 2000. COPPA provides safeguards to protect children's privacy on the Internet by regulating the collection of personal information from children under age 13.

Specifically, COPPA authorizes the Federal Trade Commission to develop and enforce rules for regulating data collection procedures by commercial websites targeted at children; moreover, the act requires that advertisers disclose their privacy policy describing data collection techniques and how that information will be used. The following section reviews the effectiveness of COPPA and other major policy initiatives.

Policy Initiatives

The possible benefits of media are—unfortunately—often left out of the policy arena in favor of debates over the detrimental effects of media use. The major questions that drive current policy decisions about children and interactive media pertain to how parents can gauge the appropriateness of children’s media consumption, and how parents and society can mitigate the potentially harmful effects of media content in children’s development. The relevance of content-driven research has yet to be widely recognized by policymakers.

The last decade has seen the development of various ratings systems across media platforms. The goal of these ratings systems is to provide parents with informative guides to content that is appropriate for their child’s age group. The Entertainment Software Rating Board (ESRB; www.esrb.org) established a ratings system in 1994 to protect children from potentially harmful game content. There are five age-based rating categories given to games:

Early Childhood (EC), Everyone (E or K-A), Teen (T), Mature (M), and Adults Only (AO; for a more specific ratings review see Wartella, O’Keefe, & Scantlin, 2000). These ratings were created with the intent to better inform parents

about the content of games before they buy them. The ratings are accompanied by content descriptors that describe the games in more detail. While previously focused on types and levels of violence, the updated content descriptors now include sexual themes, language, and the use of drugs and alcohol. While software

companies are not mandated to submit their products to the ESRB, all or most games today do have a rating (Walsh & Gentile, 2001). That is good news. But despite this intention to inform, 90% of teenagers surveyed reported that their parents never checked the video game ratings before being allowed to purchase it (Walsh, 2002).

The ESRB also started to rate online games and websites (called the ESRBi ratings) with an age-based system and content descriptors similar to those for interactive games. In addition, content descriptors for online content include other areas of concern, such as information collection and hate speech. As with games, the ratings for online content are voluntary. Unlike games, however, very few websites have submitted their content to the ESRB for evaluation (Wartella, Lee, & Caplovitz, 2002).

Today, rating systems are available across most media for children. In addition to the original rating system—the MPAA movie ratings—parents can find age guidelines on toy boxes, on television programs, websites, music, and video games. Each of these different media platforms has developed its own ratings system and the proliferation of rating systems has become a subject of public policy debate of its own. Multiple rating systems seem to create skepticism and confusion among parents. For instance, in May 2003, Common Sense Media reported that in a survey of 1000 parents, only 1 out of 5 interviewed “fully trusted the separate industry controlled ratings systems for music, movies, video games

and television” (Rutenberg, 2003). In a 2003 meta-analysis on parents’ use of and evaluation of various rating systems, about half of American parents used the various rating systems for movies, television, music,

video games, and the Internet, but they had low understanding of the various components of these systems (Bushman & Cantor, 2003). Moreover, parents were found to prefer ratings that describe the content of the media over those that only offer age guidelines. Common Sense Media (www.common sense media.org/mediaguide)

In October of 1998, Congress recognized the need to regulate online marketing to children and passed the Children’s Online Privacy Protection Act (COPPA), which went into effect April 21, 2000.

Changing Media: Fast Forward in the Information Age

Sandra Calvert,
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From the cradle to the grave, media frame a daily context in which Americans grow, develop, and eventually decline. Media are our friends, keeping us company when we are lonely. Media are our foes, teaching us violence and stereotypes about men, women, and people from varying ethnic backgrounds. Media are our hidden teachers, providing us with a vast array of potential educational and informative content that can link us to anywhere in the world at any time. Media can have lasting effects on who we are, on how we explore our sense of selves, on who we eventually become.

Media are ever changing. We once just listened to radios and watched films and television programs. Now we interact with online content and people, both real and simulated. Technologies in our cars have evolved from radios to DVD players, individual CDs played with earphone sets, and hand-held videogames. Cell phones increasingly integrate various media components into a wireless system that allows us to connect anytime, anywhere.

While we all experience the ubiquitous presence of media, our youth integrate newer media into their lives sooner than their elders do. Our teens, in particular, are relatively fearless in their approaches to newer technologies. Interactive media entertain them and inform them. They play with them, communicate with others, and use them to study. Adults certainly use these newer media, but we are often a step behind our youth. Teachers sometimes rely on their students to integrate technology into their classrooms. Parents have to be careful lest their teens place parental controls on their parents' online interactions rather than on their own. Information is power. And our children have it.

But as the wheel spins, a new generation of users and interactive technologies will emerge and converge to place our current cohort behind the times, just as they displaced their own parents' and teachers' expertise in the current rapidly changing techie world. Our ability to anticipate technological changes and their effects, and more importantly, our willingness to change and to learn, will challenge us to live our lives in fast forward with less time to pause and reflect if we want to keep up with the inevitable shifts that will come from living in the information age.

has proposed a universal ratings system that will allow parents to evaluate products using a common, easy-to-understand, media guide.

Several social policy discussions focus on the potentially harmful consequences of children's uses of interactive media. Congress authorized the Federal Trade Commission (FTC) to implement the Children's Online Privacy Protection Act (COPPA). As summarized by the Annenberg Public Policy Center (Turow, 2001), COPPA stipulated that website operators who collect information from children under 13 must: (a) provide parents with notice of their "information practices;" (b) obtain a parent's consent before they can collect, use, or disclose personal information for children; (c) provide a parent with the means to review the personal information collected from the child; (d) provide a parent with the opportunity to prevent further collection of information as well as the further use of already-collected information; (e) limit collection of personal information for a child's online activities to "information that is reasonably necessary for the activity;" and (f) establish and maintain reasonable procedures to protect the confidentiality, security and integrity of the personal information collected. The FTC also set rules about the placement of links to sites' policy, as well as the content of the policy (Turow, 2001).

With the first anniversary of COPPA, the FTC evaluated 144 sites targeted at children under 13 to evaluate their compliance with the Act (Federal Trade Commission, 2002). The FTC noted the types of personal information the sites collected, the activities offered, whether there was an indication that the site had parental consent mechanisms in place, whether the sites provided links to their privacy policy from the home page and from at least one information collection point, and evaluated the content of the privacy policy itself. Of the 144 sites, 72% collected personal information from children,

the most common of which were the child's email address and name, and another person's email address. The FTC staff concluded that most of the sites that collected personal information (84% of sites) appeared to have done so to obtain consent or would

otherwise fit under one of the Act's exceptions (e.g., using information for limited purposes and deleting the information). Most websites (89%) that collected information posted privacy policies; 82% linked to the policy from the home page, and 76% did so on at least one page where personal information was collected. Of the sites surveyed, only 47% of those that collected information had parental consent or notification mechanisms; another 18% collected information that could fall under one of the exceptions and would not necessitate parental consent. The remainder (35% of sites) collected too much information to fall under any exceptions. In terms of the content of the privacy policy itself, the FTC found that most sites (over 90%) complied with rules on the disclosure of the types of information collected and how that information would be used. Compliance with the disclosure of parental rights, however, was poor—only 52% of sites made the appropriate disclosures. Thus, while most websites observed COPPA rules on providing a privacy policy and disclosing how the information collected would be used, other COPPA provisions—particularly those related to parental consent—were followed less faithfully.

The Center for Media Education (CME) conducted a similar evaluation of the success of COPPA (Center for Media Education, 2001). Studying a sample of 153 top commercial websites directed at children under 13, the CME found that COPPA has spurred changes in websites' data collection practices. Websites had limited the amount and type of information (e.g., name, postal address, phone number, age) collected from children, and there was a three-fold increase in the posting of privacy policy

information explaining sites' data collection practices. A few sites found innovative solutions (e.g., anonymous registration) that allowed children to interact with site content without

revealing personal information. Overall, however, the Center found that many sites were not doing their best to comply with the provisions: most (66%) did not place links to privacy policies in "clear and prominent" places, and only some sites (38%) obtained

Moreover, parents were found to prefer ratings that describe the content of the media over those that only offer age guidelines.

parental consent in accordance with key provisions. Further, researchers pointed out that in trying to discourage children under 13 from entering personal information, some sites might inadvertently encourage children to falsify their ages.

In response to the findings from the studies, researchers at the Annenberg Public Policy Center and the Center for Media Education made several recommendations. Turow (2001) suggested the FTC should require Web sites that have to comply with COPPA to display a “K” (for “kids”) on the home page in a specific place, so that parents can tell children to only interact with sites that have a “K” on them. Further, the FTC should push for children’s Web sites to collaborate in creating a standard format for the required privacy information so that parents can assess sites easily. The Center for Media Education proposed that Web site operators limit their data collection, provide online activities that do not necessitate personal information from participants, review and make simple changes to their privacy statements and data collection procedures, and reevaluate their age screening methods. Further, policymakers should consider the following: monitor sites’ compliance with COPPA and take action against violators; simplify and clarify COPPA and address shortcomings; address how computer security violations may jeopardize children’s privacy; and promote the awareness of online privacy issues among teachers (Center for Media Education, 2001).

As electronic media evolve and platforms converge, an important policy issue is the changing FCC policies regarding restrictions on broadcast outlet ownership. In June 2003, the FCC voted to ease restrictions on the number of broadcast stations one company could own nationwide. In addition, newspaper owners would be allowed to purchase stations in the same market. This deregulation alarmed child advocates because it presented an opportunity for stations to rebroadcast the 3-hour educational programming requirement on sister stations, thereby providing less diversity in programming. Children Now, in response to the media consolidation threat, conducted a case study in the Los Angeles market to analyze the programming in 1998, when there were seven major broadcast stations, to 2003 when there were only five (Children Now, 2003). The study reported that the number

of children’s series as well as the number of hours per week devoted to children’s programs decreased by half. Most of these decreases could be attributed to the stations that were part of duopolies.

If it was the intention of stations to get around the Children’s Television Act’s ruling that stations air at least 3 hours of educational television per week by repeating programs from their sister stations, they lost the chance. Along with the media consolidation ruling, the FCC also stated that stations were not

As electronic media evolve and platforms converge, an important policy issue is the changing FCC policies regarding restrictions on broadcast outlet ownership.

allowed to circumvent the 3-hour rule in this way. It was a victory for child advocates.

Congress continues to be concerned about media’s effects on children. In April 2003, hearings were held to look at the relationship between video game-play and children’s brain activity. Concern over babies uses of television and other screen media, the amount of violence in video games, and the lack of federal funding for research on the effects of media on children led to the May 2004 announcement of the Children and Media Research Act (CAMRA), introduced in the U.S. Senate by Senators Sam Brownback, Hilary Clinton and Joseph Lieberman. It authorized a \$90 million federal grant program within the National Institute of Child Health and Human Development to support research on the effects of media on children’s physical and psychological development. The passing of this bill would generate research that addresses these urgent questions and represent a landmark decision in policymaking for children and media.

Conclusions

The potentials that interactive media offer to children’s development are not well understood. With the introduction of CAMRA, we hope to see some of the research gaps filled.

Time to Quicken the Pace of Children and New Media Research

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University of Arizona

Wartella et al. map quite well the relatively modest empirical evidence that has accumulated to date examining the role of interactive media in children's lives. Yet speculations far exceed conclusions as the pace of academic investigation of children and new media grinds forward slowly. When can we expect informative answers to the compelling questions these authors pose? Consider this earlier precedent.

Television first entered the American household during the 1950s, and most U.S. homes owned a TV set before 1960 (Comstock, Chaffee, Katzman, McCombs, & Roberts, 1978). While television soon transformed childhood in meaningful ways, researchers were not too quick to document it effectively. As of 1972, more than 20 years after TV had become widely available, the only major national study on the topic of children and television was the U.S. Surgeon General's report on TV violence (Surgeon General's Scientific Advisory Committee, 1972). Literature reviews were slow to draw strong conclusions about any aspect of children's television use and effects concerns. Not until the 1980s, when the NIMH published its comprehensive report "Television and Behavior" (Pearl, Bouthilet, & Lazar, 1982), did this pattern begin to change.

If this historical pattern with television research is repeated with children and new interactive technologies, we shouldn't expect to see any significant conclusions across studies until roughly 2020. We can hardly afford to wait that long to find out how computers, the Internet, and other new media impact cognitive development, social interaction patterns, and children's consumer behavior, among other critical concerns. What can we do to expedite the growth of knowledge in this area?

Creating and nurturing an infrastructure for children and new media research is critical. The academy needs to recognize its importance, and the government and other sources of research funding need to appreciate the value of such investments. For decades, literally hundreds of millions of dollars have been spent each year on educational research; yet the evidence is clear that children spend more time with media than they do in the classroom. Federal government support for children and media research has been dismal for far too long, and the meager funds available have been spread across a variety of agencies in a way that has limited any programmatic development.

Legislation introduced in the 108th Congress known as the CAMRA (Children and Media Research Advancement) Act is the first serious effort to reverse this pattern of neglect. It would authorize \$90 million of NICHD funding for new empirical investigations over five years. That support would attract and nurture new interdisciplinary research teams, and afford a more theoretical and systematic approach to the topic area. Peer review by scientists would determine the agenda, not anyone's political preferences.

While scientists can appreciate the benefits that would be produced by such support, some observers have already derided the CAMRA proposal. Citizens Against Government Waste (2004) argues that "the \$90 million program will contribute nothing new, will not solve any perceived problems, and is a prime example of government waste." This criticism is echoed by Brent Bozell and the Parents Television Council, a conservative advocacy group that believes they already have all the evidence they need to indict the media as they combat indecency on the airwaves.

In the face of such criticism, it is clear that the scientific community needs to convey more clearly the value of its work, and to marshal political support for media research that can enhance the beneficial outcomes of children's time spent with media, as well as identify harmful effects.

Interactive media are now being created and marketed with the youngest children in mind (e.g., *JumpStart Baby*, *Little Touch LeapPad*, and *Barney Actimate*). Even babies and toddlers spend significant time with these media (Rideout, Vandewater, & Wartella, 2003) but we know little about very young children's use of interactive technologies and the impact of such use. Understanding young children's media use is not only

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necessary to integrate research in a developmental framework; it is also particularly important in light of the American Academy of Pediatrics' recommendation that screen time be discouraged for children under the age of 2.

Research on interactive media content must move beyond studying violence to, among other things, educational content, the activities performed, and content of online messages exchanged. These questions have to be asked not only of interactive media that have been the focus of existing research (i.e., video games, computer software, the Internet), but also of new appliances such as wireless technologies and interactive toys. What is apparent is the lack of a theoretical framework that might guide research in this area. Interactive technologies traverse platforms and combine features formerly thought to be unique to one medium—the text in print media, audio and music in radio, audio-visual information in television—with the added complication of user control and input. What is needed is an overarching framework drawing

from research in these areas that might inform studies on how children use these media, as well as their effects. Interactive media blur the lines between user, content, activity, and platform, and traditional ways of conceptualizing media may prove to be inadequate when applied to newer technologies. Examining synergies in the ways in which children use these and other media to pursue their interests may be another fruitful approach for researchers.

Social policy about interactive media for children has understandably focused on health and safety issues: providing parents with information about the appropriateness of content of interactive media products, protecting children online from inappropriate requests for information and from child predators, and providing public scrutiny of the violent content of video games and other entertainment media. It would also be helpful to inform parents of ways in which positive, enriching media can enhance children's lives. If educational television has been successful in fostering children's cognitive and social development (Anderson et al., 2001), one might expect that interactive media would have similar, if not greater, potential.

As children's engagement with interactive media grows, and as the networked world of interactive media allows for convergence across media platforms and industries, new concerns will arise. The changing marketplace of interactive media will continue to pose new social policy challenges; and because children are early and heavy adopters of media technologies, they will continue to be a focus of policymakers' concerns.

Authors' Note:

Funding for this research was provided by National Science Foundation Grant #BCS-0125731. This research was conducted under the auspices of the Children's Digital Media Center at the University of Texas at Austin. The authors would like to thank Alice Cahn for comments on earlier drafts of this work. Correspondence concerning this article should be addressed to Ellen A. Wartella, University of California Riverside, Office of the Executive Vice Chancellor and Provost,, 4148 Hinderaker Hall, Riverside, California 92501 (email: ellen.wartella@ucr.edu)

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The *Report* provides a forum for scholarly reviews and discussions of developmental research and its implications for policies affecting children. The Society recognizes that few policy issues are noncontroversial, that authors may well have a "point of view," but the *Report* is not intended to be a vehicle for authors to advocate particular positions on issues. Presentations should be balanced, accurate, and inclusive. The publication nonetheless includes the disclaimer that the views expressed do not necessarily reflect those of the Society or the editors.

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